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TRADE AND DEVELOPMENT BOARD
Commission on Enterprise, Business
Facilitation and Development
Fourth session
Geneva, 19-23 July 1999
Item 2 of the provisional agenda

PROVISIONAL AGENDA AND ANNOTATIONS

I. PROVISIONAL AGENDA

1. Election of officers

2. Adoption of the agenda and organization of work

3. Assessment of innovative policies and non-fiscal measures for upgrading SME clusters, promoting investment to SMEs and developing their external linkages, taking into account the respective roles of the private sector and governmental and other institutions, with the aim of fostering competitiveness, innovation and productivity in a globalizing world economy

4. Electronic commerce and the integration of developing countries and countries with economies in transition in international trade

5. Reports of the subsidiary bodies of the Commission

6. Progress report on the implementation of agreed conclusions and recommendations of the Commission

7. Other business

8. Adoption of the report of the Commission to the Trade and Development Board

GE.99-52042

II. ANNOTATIONS TO THE PROVISIONAL AGENDA

Item 1 - Election of officers

1. Rule 18 of the rules of procedure of the Main Committees of the Trade and Development Board states that: "At the commencement of the first meeting of each regular session, the Committee shall elect a Chairman, five Vice-Chairmen and a Rapporteur from among the representatives of its members. These officers shall constitute the Bureau of the Committee. In electing the officers, due account shall be taken of the need to ensure an equitable geographical distribution". Moreover, rule 19 indicates that "the Bureau of the Committee shall consist of seven members, including four members from Groups A and C combined, two members from Group B and one member from Group D, referred to in the annex to General Assembly resolution 1995 (XIX) as amended". According to the cycle of rotation, the Chairman of the Commission at its fourth session shall be a representative of a State member from List A and the Rapporteur from a State member of List C. The five Vice-Chairmen shall therefore be distributed as follows: 2 from Lists A and C combined, 2 from List B and 1 from List D.

Item 2 - Adoption of the agenda and organization of work

2. The provisional agenda in section I above was approved by the Commission on Enterprise, Business Facilitation and Development at its third session (TD/B/45/15-TD/B/COM.3/20, annex I).

Organization of work

3. The Commission will have five working days, from 19 to 23 July 1999, to complete its work. The first plenary meeting, on Monday, 19 July, will consist of the opening and formal introduction of item 3. It is suggested that the rest of Monday, 19 July, and Tuesday, 20 July, be devoted to informal discussions on item 3 of the provisional agenda.

4. On Wednesday, 21 July, it is suggested that the Commission start consideration of item 4 of the provisional agenda. The consideration of this item, in both formal and informal settings, would continue until the end of the morning session of Thursday 22 July. The afternoon of Thursday and the morning of Friday, 23 July, will be devoted to discussing the outcome of the session.

5. The reports of expert meetings, as well as the progress report on the implementation of agreed conclusions and recommendations of the Commission, will be considered under the appropriate agenda items on Thursday afternoon or Friday morning.

Documentation

TD/B/COM.3/21 Provisional agenda and annotations

Item 3 - Assessment of innovative policies and non-fiscal measures for upgrading SME clusters, promoting investment to SMEs and developing their external linkages, taking into account the respective roles of the private sector and governmental and other institutions, with the aim of fostering competitiveness, innovation and productivity in a globalizing world economy

6. With a view to expediting substantive discussions at the Commission's session, the secretariat has prepared an issues paper entitled, "Policies and non-fiscal measures for upgrading SME clusters - an assessment" (TD/B/COM.3/22).

7. The paper is divided into four sections. The first section highlights the increasingly technology-intensive nature of production in a globalizing world economy and the parallel necessity for firms in developing countries to acquire technological capabilities as both a means to upgrade and sustain competitiveness. The second section focuses on contextual factors that influence the process of upgrading and emphasizes that the process of upgrading and technological capability development will depend on context and country-specific factors that will determine the ease, cost and speed of the process of upgrading. In this context, policy considerations are discussed and policy-makers are cautioned that over-reliance on FDI as the main vehicle for upgrading can result in the stifling of local technological effort. The importance of technological infrastructure is also stressed. The third section presents selected case studies in upgrading SMEs and SME clusters and lessons to be learnt. The fourth section examines the role of public policy in facilitating and stimulating SME cluster upgrading and technological capability development, including the role of private sector institutions and the international community.

Documentation

TD/B/COM.3/22	Policies and non-fiscal measures for upgrading SME clusters - an assessment

Item 4 - Electronic commerce and the integration of developing countries and countries with economies in transition in international trade

8. Responding to the request made by the Commission at its third session to pursue its analytical and research work on links between electronic commerce and development, with special focus on measures and policies likely to enhance the ability of developing countries and countries with economies in transition to participate more fully in global electronic commerce, the secretariat has prepared a short background document entitled "Can electronic commerce be an engine for global growth? Electronic commerce and the integration of developing countries and countries with economies in transition in international trade: trends, issues and possible actions".

9. As a complement to the reports which are being produced in the context of the preparations for UNCTAD X and the series of regional workshops requested by the Commission on 'electronic commerce and development', this document attempts to assist the work of the Commission by (1) summarizing the efforts made so far in the context of the Commission's work on electronic commerce, and (2) identifying some additional issues which call for further analysis in this area.

Documentation

TD/B/COM.3/23	"Can electronic commerce be an engine for global growth? Electronic commerce and the integration of developing countries and countries with economies in transition in international trade: trends, issues and possible actions"

Item 5 - Reports of the subsidiary bodies of the Commission

10. Following the decision made at the third session of the Commission, the Expert Meeting on Sustainable Financial and Non-financial Services for SME Development was held from 2 to 4 June 1999. The report of the Expert Meeting is contained in document TD/B/COM.3/26-TD/B/COM.3/EM.7/3. In taking note of the report, the Commission may wish to endorse the recommendations contained therein.

Documentation

TD/B/COM.3/26 TD/B/COM.3/EM.7/3	Report of the Expert Meeting on providing sustainable financial and non-financial services for SME development

11. The Commission will examine the conclusions of the Expert Meeting on Capacity-building in the Area of Electronic Commerce: Legal and Regulatory Dimensions, held in Geneva on 14-16 July 1999. Since this meeting will be held the week before the Commission, an oral report will be presented by its Chairman.

Item 6 - Progress report on the implementation of agreed conclusions and recommendations of the Commission

12. Responding to the request made by the Commission at its third session, the secretariat has prepared papers which review progress on the implementation of agreed conclusions and recommendations of the Commission since its third session. The papers take stock of the progress achieved and consider matters that may require further work in the period post UNCTAD X.

Documentation

TD/B/COM.3/25	Progress report on the implementation of agreed conclusions and recommendations of the Commission: The impact and relevance of electronic commerce on trade growth and development.
TD/B/COM.3/27	Progress report on the implementation of agreed conclusions and recommendations of the Commission: Issues related to enterprise development.

Item 7 - Other business

14. At its thirty-third session, the Working Party decided, in paragraph 10 of its agreed conclusions relating to the in-depth evaluation of the Trade Point Programme, to invite the Secretary-General of UNCTAD to seek advice, in particular from Trade Point managers and end-users of Trade Points, on "the proposals to be made by the secretariat with respect to the implementation of the recommendations contained in the evaluation report, and to advise on future actions aimed at enhancing programme delivery, especially with regard to the assistance to be provided to the Trade Points" (TD/B/WP/115). It also requested that the conclusions should be transmitted for consideration to the fourth session of the Commission on Enterprise, Business Facilitation and Development. Further, it should be recalled that the Working Party decided at the same session, in paragraph 9 of its agreed conclusions, to invite the secretariat to prepare a Trade Point Programme strategy for further consideration by the Working Party, paying particular attention to the content of the evaluation report and to the deliberations of the Working Party thereon. This strategy should contain proposals on the financial and technical feasibility of the implementation of the recommendations contained in the report. In the same paragraph, the Working Party further requested that "in this context the secretariat should prepare a comprehensive report detailing all the activities undertaken to implement various mandates entrusted to it since the inception of the Trade Point Programme".

15. In response to paragraph 10 of the Working Party's agreed conclusions, Trade Point managers, end-users of Trade Points and government experts acting in their personal capacity met in Geneva from 26 to 28 May 1999. The conclusions of their deliberations, contained in document TD/B/COM.3/24, are transmitted for consideration to the fourth session of the Commission on Enterprise, Business Facilitation and Development

Documentation

TD/B/COM.3/24 "In-depth evaluation of the Trade Point Programme: Follow-up to the decision adopted by the Working Party on the Medium-term Plan and the Programme Budget at its thirty-third session".

Item 8 - Adoption of the report of the Commission to the Trade and Development Board

16. The report of the Commission on its fourth session will be considered by the Trade and Development Board.

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TRADE AND DEVELOPMENT BOARD
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Item 3 of the provisional agenda

POLICIES AND NON-FISCAL MEASURES FOR UPGRADING SME CLUSTERS - AN ASSESSMENT

Issues paper by the UNCTAD secretariat

Executive summary

It is important that policy-makers focus on technological capability building as an essential element for the sustained competitiveness and productivity of SMEs in an increasingly technology-intensive global economy.

The neglect of domestic research and development activities has serious implications for the development of local technological capability. It hampers the ability to absorb and adapt foreign technologies, as well as the ability to obtain favourable technological transfer contracts. It will therefore constrain the ability of developing countries to technologically upgrade and undermine their international competitiveness.

The increasing knowledge-intensity of production in a globalizing world economy requires structural change which will have to be addressed by long-term policy measures. FDI can accelerate the process of technological upgrading, but it cannot substitute for local technological capabilities.

SMEs are obliged to seek partners and to leverage what few resources they can marshal through cooperative relationships with large firms. However, unless SMEs possess absorptive capacity, the extent of technology transfer through such links and the positive impacts of globalization will be minimal.

Since the bulk of the world's technology is in the hands of transnational corporations (TNCs), creating TNC-SME linkages in order to network SMEs into the global economy is a key element of innovation policy. Experience shows that in order to improve upon the impact of globalization on the SME sector and enhance the benefits from TNC-SME linkages, it will be necessary to build and strengthen networks between SMEs and local research institutions, including creating and strengthening North-South networks between researchers in order to facilitate knowledge creation in the South. A critical part of ensuring SME access to technology, information and new knowledge is the provision of financial support for the transfer and diffusion of technology.

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I. PREFACE

1. As mandated by the ninth session of the United Nations Conference on Trade and Development (UNCTAD IX), the Commission on Enterprise, Business Facilitation and Development deals with the areas defined in paragraphs 89(h)-(j) and 92-94 of "A Partnership for Growth and Development" (TD/378/Rev.1).

2. At its first session, the Commission on Enterprise, Business Facilitation and Development recognized the crucial role played by small and medium-sized enterprises (SMEs) in stimulating broad-based, equitable and sustainable development. It also acknowledged the changing global economic environment and the pressures faced by SMEs a result and it stressed the need to develop a coherent strategy for enterprise development, with a particular focus on SMEs.

3. The Commission recognized that further analytical work and policy research within UNCTAD was needed to develop enterprise development strategies, and it identified four areas for future work: (i) the respective roles of government and the private sector, including non-governmental organizations, and the interactions between them in creating a coherent policy framework and setting up effective support measures and structures for the development of SMEs and micro-enterprises, in particular those in least developed countries; (ii) the possible value as well as the ways and means of promoting and facilitating effective inter-firm cooperation, including clustering, networking and technology partnership, both domestically and internationally, as an instrument in fostering the development and competitiveness of enterprises; (iii) the development of innovation, entrepreneurial and technological capabilities as essential inputs for the development and growth of enterprises; and (iv) the short- and long-term impacts of macroeconomic reform and liberalization on the development and growth of enterprises, particularly SMEs.

4. In line with the above topics, the first expert meeting convened by the Commission discussed government and private sector roles and interactions in SME development. The second and third expert meetings convened by the Commission discussed inter-firm partnerships and SME clustering and networking respectively. The policy recommendations from these last two expert meetings were discussed at the third session of the Commission on Enterprise, Business Facilitation and Development. At that session, the Commission noted that globalization and the post-Uruguay Round environment had brought with them a new competitive environment and hence new requirements for sustained competitiveness on the part of firms. The Commission therefore called upon the UNCTAD secretariat to organize a further expert meeting to discuss the development of sustainable local services, including financial and non-financial services, and human resource development, to improve and promote the capacity of SMEs in developing countries, and to prepare a study on innovative non-fiscal measures for upgrading SME clusters.

5. The provisional agenda for the fourth session, approved by the Commission at its third session, includes an assessment of policies and non-fiscal measures for upgrading SME clusters (agenda item 3). This report has been prepared by the UNCTAD secretariat in order to facilitate consideration of this item.

II. OVERVIEW

6. As a consequence of globalization, the requirements for development have changed. Competitiveness is increasingly dependent on the ability of firms to use and develop new technology effectively. New core technologies such as microelectronics and biotechnology that have applications across a wide range of sectors have emerged. Moreover, these technologies reinforce one another, and a number of sectors and industries are affected by more than one of the new technologies. In view of their wide-ranging applications, access to these new technologies is increasingly becoming crucial to international competitiveness (Kumar and Siddharthan, 1997).

7. The new innovation-based mode of competition rapidly renders obsolete the technological capacity built up by firms and calls for a continuous process of upgrading. Failure to do so leads to a loss in market share and profitability. Governments are consequently being urged to adopt innovation policies that are focused on enhancing domestic technological capabilities as the most effective way to enable firms to continuously upgrade and achieve and sustain global competitiveness.

8. Technological capabilities can be described as information and skills - technical, organizational and institutional - that allow productive enterprises to utilize equipment and information efficiently (Lall, 1994). Know-how capabilities are often referred to as production and process capabilities (see box 1). Experience shows that the process of upgrading and technological capability development takes time and can involve considerable costs to the firm.

9. Upgrading and technological capability development vary according to the level of a country's development. In most developing countries, technological capability development will largely mean becoming more efficient and competitive through the use of imported technologies. Some ability to modify the design or materials used in order to solve problems that arise from a variation in product or the processing environment will be required. In the least developed countries, technological capability development will comprise the mastery of simpler and well diffused technologies - largely assembly operations. In the more advanced developing countries, technological capability building will involve the mastery of complex scale and skill-intensive technologies with a greater emphasis on science-based R&D and design capabilities. Broadly, technological capability can be seen to have three main components: absorption, adaptation and creation.

10. It is now well established that technology is more than just technical hardware. It involves the interlinkage of a range of activities such as the development of a company strategy and the technological

development of personnel. In order to attain and maintain competitiveness firms must possess relevant economic knowledge or capabilities (see box 1). Some of these capabilities can be acquired 'ready made' from the market. For example, any enterprise using a new technology can accumulate some know-how as an automatic result of the production process. Such learning is, however, insufficient to ensure survival as more complex technology is encountered or if market conditions become more demanding. The acquisition of know-what, know-why and know-who requires a concerted effort and investment on the part of the firm itself and demands a certain level of competence from its employees. In other words, upgrading goes beyond choosing and adopting technologies from industrial countries and includes the accumulation of domestic assets which embrace technological competencies and capabilities, organizational capabilities and the management of links between different types of actors or institutions that are important in this process (UNCTAD, 1998a).

11. Firm-level technological development depends on external factors such as interaction with the local economic environment, which provides the human and financial resources needed for the cultivation of internal capability and essential services such as standard setting, testing, basic R&D and other forms of institutional support that enable firms to conduct in-house technical work effectively. Thus, technological upgrading and capability development has to be dovetailed with improvements in education and training systems, as well as with the provision of technology support and financing.

12. Technology is concentrated in the more advanced economies of the world and access to technology and the transfer of technology are extremely important issues for the growth and development of developing countries and LDCs.

13. The transfer of technology occurs in various ways. Direct purchases of equipment are the most obvious. Direct purchases often come with technical aid (installation and service) from manufacturers and can be a source of technological learning, although limited. Accompanying manuals and blueprints can be the source of capability development, especially if firms go a step further to undertake reverse or imitative engineering. Other sources of technology transfer such as licensing, foreign direct investment (FDI) leading to joint ventures, original equipment manufacturing (OEM) and other subcontracting arrangements serve a dual purpose, providing rapid access to technology as well as access to global markets.

14. Licensing and subcontracting arrangements tend to result in greater and in some cases more complex technology transfers because it is in the interests of the subcontracting transnational corporation (TNC) to ensure quality, price and delivery according to the precise specifications of the product in order to safeguard its brand name. In a very few instances, OEM has fostered own design manufacturing (ODM). Under ODM, the local firm carries out some or all of the product design and process tasks according to a general design layout from the TNC.

Box 1

A matrix of technological capabilities

	Public agencies Producer assns.	Producing unit	Educational/R & D institutions
	Acquisition 'know-what'	Utilization 'know-how'	Absorption 'know-why'	Innovation 'know-who'
Product-related technological capabilities	evaluate and asesss alternatives	quality control/ standardi-zation	improvements in productivity attention to maintenance	introduction of variety improvements in quality reduction in costs new combinations of generic technologies
Process-related technological capabilities	scan, choose and access suppliers depackage imported technology	problem identifi-cation source & procure spare parts and other inputs linkages to clients and equipment suppliers	problem solving, innovation modify existing plant and equipment linkages to productivity centres and to suppliers	in-house process engineering to reproduce and redesign existing processes and create new ones linkages to indigenous and external engineering consultancy services and technology institutes
Organizational technologies	selection and acquisition skills, e.g. bargaining, ability to arrange financing & prepare feasibility studies	organize and carry out maintenance routines, training activities & day-to-day production activities	strategic planning capabilities marketing, engineering, and testing skills	skill in managing a portfolio of partnerships in-house R & D capabilities ability to change decision routines & alter the organisation of production

Adapted from UNCTAD (1990).

ODM offers the local firm a mechanism to capture more of the design value-added without having to invest in marketing and distribution networks. ODM represents an advance in technological competence on the part of the local firm. Thus, subcontracting arrangements can be a first step up the ladder of technological mastery.

15. Subcontracting arrangements such as the ones described may, however, delay the emergence of in-house R&D. They can also be a means to maintain competitiveness through low-wage production. Mytelka (1978 and 1998) and Dodgson (1998) point out that over-reliance on subcontracting arrangements by the newly industrializing economies (NIEs) of Asia led to an underdevelopment of technological capabilities which is revealed by a lack of capacity to develop, produce and market technological innovations by NIEs, including the more successful ones among them, namely the Republic of Korea and Taiwan, Province of China.

16. The process of catching up and keeping up technologically will be extremely costly and risky for developing countries. Given the rate at which changes occur and the capital-intensity of some new technologies, some commentators caution Governments against rushing to launch big national catch-up efforts because by the time there would be anything to show for their efforts, the world would have moved on (*The Economist*, 1999). Others advise venturing into technologies with affordable R&D intensities such as biotechnology and energy technologies (Anandakrishan, 1998).

17. Apart from its R&D affordability, biotechnology appears to have other attractions for developing countries. Current barriers to entry into the biotechnology field are relatively low (Fransman, 1994). Certain skills, capabilities and infrastructure are already available in developing countries and could be upgraded with little effort, and a rich genetic heritage is also present (Kumar and Siddharthan, 1997). Obvious entry points are in agriculture and agri-processing, in which most developing countries are largely engaged. Moreover, biotechnology feeds into the development of new materials, and new materials have important synergies with microelectronics. It should be noted, however, that the TRIPs agreement may mean diminished access to genetic materials used as inputs to research in developing countries in the years to come (UNCTAD, 1999a).

18. Although the target of effective innovation policies is the individual firm, these policies are most effective when directed at networks or clusters of firms. Informal contact with other firms is an important mechanism for the transmission of tacit knowledge that is not easily transferable and has to be taught and learned. New production knowledge or knowledge of best practices can often be transmitted in this manner. Clustered firms can thus enhance technological capability through specialization, tacit knowledge flows and cross-organizational learning. They can share the costs of technological upgrading and innovation and reap other economies of scale by functioning as a group rather than on an individual basis. In addition, cluster-based interventions yield efficiency gains and cost

reductions because of the possibility of pooling business services and channeling limited resources into activities that can maximize returns. Consequently, clusters permit focused interventions whose benefits can be diffused rapidly and can have a powerful demonstration effect in the local economy. SME clusters and networks are widely considered to be one of the most cost-effective ways of delivering technical assistance to SMEs to upgrade technology, management and marketing strategies (UNCTAD, 1998b).

III. CONTEXTUAL FACTORS THAT INFLUENCE UPGRADING

19. In both developed and developing countries, there is compelling evidence that clustering helps SMEs to compete effectively in the global economy. Not all clusters, however, grow to become world competitors. Some clusters, or firms located within clusters, grow while others stagnate or regress. Such clusters typically pursue the 'low road' to competitiveness and engage in short-term cost-cutting exercises and cut-throat low-wage, low-quality measures in response to competitive pressures. In contrast, successful clusters pursue the 'high road', which promotes increased productivity, innovation and good labour standards, thus ensuring economic growth that is accompanied by higher standards of living and is sustainable.

20. The process of upgrading and technological capability development will not be the same for all countries. Much will depend on context and country-specific factors that may exert an important influence on the ease, cost and time that the upgrading process will take. Thus, policies for upgrading clusters will have to be geared towards the technological endowments of a country. In addition, there is no predictable learning curve which all firms travel. This renders the outcome of the upgrading process uncertain. In most developing countries, where the culture of learning is weak, this uncertainty is made worse by the likelihood that the learning process itself may have to be learned.

21. In order to induce learning in the economy, policy-makers have to put in place policies that exert pressure for change and policies that affect the capability to impose and absorb change. The first set of policies constitutes the incentive framework that gives rise to the demand for local technological effort. Such a framework calls for an enabling environment that includes policies to engender competition in the domestic market. Attention must, however, be paid to the choice of such policies, their timing and sequencing. The second set of policies calls for the development of technological infrastructure which includes human resource development, universities, research institutions, quality assurance centres and all other policies and institutions which provide sources of and access to knowledge and which motivate partnering and collaboration for technological development. This set of policies requires policy actions at the meso and micro levels, as well as co-operation between the public and the private sector.

A. Policy Considerations

22 Policy choices by Governments play a pivotal role in shaping and stimulating the development of technological capability. The development of innovation capabilities appears to have been most successful in those economies that have followed an outward-oriented strategy. One reason is that competition is considered to be the most potent stimulus for technological effort, and export orientation has proved more effective in creating the competitive market conditions that are important for stimulating the demand for technological learning. A second reason is that surveys of SMEs show that feedback from clients and suppliers are the two most prominent sources of new information and provide a powerful incentive to innovate. As a result, entrepreneurs need to be trained to be receptive to such feedback and indeed should seek it out.

23. However, outward orientation by itself has not proved a sufficient condition for generating technological capability or innovation. For instance, Hong Kong adopted a *laissez faire* approach to its development and focused on providing a stable administrative and macroeconomic regime. As a result, Hong Kong developed a light, specialized and efficient manufacturing base which, nonetheless, lacks technological depth and is therefore vulnerable to rising labour costs. Consequently, wage pressures forced many of Hong Kong's manufacturers to relocate to other countries, starting a trend of deindustrialization.

24. A stable macroeconomic environment permits firms to plan and develop a growth strategy. This is particularly true when it comes to making investments that require a medium or long-term horizon. Innovation is critically dependent on access to technology, and trade policies should not discourage its importation. In addition, the existence and enforcement of intellectual property regulation and adherence to the Agreement on Trade Related Investment Measures (TRIMs) is increasingly important in attracting FDI and facilitating access to and the transfer of foreign technologies.

25. No conclusive evidence exists on the benefits and costs of intellectual property protection established by the Agreement on Trade-Related Aspects of Intellectual Property Rights (the TRIPs Agreement) and administered by the World Trade Organization. Such protection is unlikely by itself to lead to any general increase in the rate and level of innovation. However, there are fears that it may have negative effects in-so-far as public research institutes may be inclined to protect their research results and grant exclusive rights of exploitation to a private enterprise. It is not clear either what its impact is likely to be on the transfer of technology. It is likely to pre-empt reverse engineering and similar avenues of capability development which have been an important source of capability development for countries and territories such as the Republic of Korea and Taiwan, Province of China. Certainly, the cost of obtaining protected technology will be higher and beyond the means of most developing country SMEs. Moreover, the evidence indicates that, since the 1970s, access to technological and scientific knowledge

held in advanced nations has become more difficult for developing countries and that higher levels of protection may reinforce this trend (South Centre, 1997). While measures to prevent the abuse of technology rights or practices which impede the transfer and dissemination of technology are quite common in developed countries, there is a lack of legislative measures in this regard in many developing countries where the occurrence of these practices has been observed.

26. The TRIMs Agreement obliges developing country members of the WTO to phase out all trade-related performance requirements imposed on enterprises, such as local content regulations and export obligations. The objective of the TRIMs Agreement is to establish rights of entry and prohibit favourable treatment for national over foreign firms. However, the Agreement tends to diminish the ability of developing country Governments to direct FDI according to their developmental goals (Kumar and Siddharthan, 1997).

27. TNCs control a major share of technology-intensive industries and access to new technologies. Foreign direct investment is acknowledged to be a potentially powerful instrument for improving access to international markets and for obtaining technological and organizational capabilities and thus enhancing the international competitiveness of the host developing country (Chudnovsky and López, 1999). This would seem to suggest that Governments may follow one of two paths to development, the first encompassing a vision of a free trade economy with heavy reliance on foreign investment and foreign technology, and the other centring on a vision of a deep and diverse industrial sector with predominantly nationally owned enterprises capable of autonomous innovation. The question for many developing countries embarking on a process of upgrading and technological capability development is which of these paths is the most effective.

28. Singapore is perhaps the most celebrated case of technological upgrading via FDI and has achieved impressive export-led growth rates, ranking as the world's most competitive economy in 1995. By directing FDI inflows into higher value-added, high-tech activities, Singapore rapidly evolved from assembly based on cheap labour to advanced automated manufacturing. There were, however, no interventions in relation to technology transfer in Singapore. Thus, although Singapore has been very successful in building up indigenous production, it has the weakest indigenous entrepreneurial and technological base of the East Asian NIEs (Lall and Kell, 1991). Singapore's product range is narrow and its technology is almost entirely provided from abroad.

29. The experience of Singapore clearly shows that a reliance on FDI can reduce some of the learning requirements for developing countries and that an economy can make significant advances if it carefully selects and guides FDI inflows. However, it also suggests that achieving a more widespread diffusion of TNCs' technologies and creating interlinkages with local firms requires specific

interventions to promote local capability development.[1] Evidently, the potential benefits from FDI cannot be taken for granted.

30. Technology imports are undisputedly a necessary input to local capability development for any developing country. However, an important lesson to be learnt is that the mode of technology import has an important effect on the extent and nature of local capability development. Internalized modes such as FDI tend to centralize the process of innovation in the home country, whereas externalized modes such as licensing, equipment purchase, arms length contracts, etc., are inclined to lead to more technological learning and a better understanding of the technology transferred. Even then, the effective transfer and mastery of the technology will hinge on prior investments in technical and managerial capabilities, i.e. absorptive capacity.

31. In general, the evidence indicates that in countries that are technologically weak, the extent of technology transfer by TNCs is correspondingly weak. In these cases, TNC subcontracting of local firms is confined to relatively simple components, with little transfer of technology apart from assistance with quality control techniques and minor adaptations. Joint venture arrangements also tend to be in low-technology, low value-adding manufacturing. Where the technological and absorptive capacity of the local firm has been high, experience shows that some transfers of product and process technologies of high precision and good quality to local subcontractors have occurred. Technology transfers by TNCs have rarely extended to high value-added and technologically demanding tasks such as design and development. Hence, a reliance on policies which encourage FDI from TNCs is more likely to lead to technological upgrading in terms of facilities and equipment but is unlikely to build innovation capabilities (Dodgson, 1998).

32. It should be stressed that process and production technologies are easily replicable and cannot provide the basis for longer-term, sustainable competitive advantage at a global level.

B. Technological infrastructure

33. The ability to absorb technology, to deploy it efficiently and to create it depends not only on the internal decisions of firms and on level of competence, but also on the level and quality of the country's technological infrastructure. The drive towards upgrading and developing technological capability will be influenced by the availability of people capable of understanding, absorbing, adapting, and ultimately developing new technologies. It will also depend on the availability of supporting technological infrastructure and finance for technological activity. Governments will need to pay attention to reforms at the meso- and micro economic levels in order to improve the overall competitiveness of SMEs and

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[1] See UNCTAD (1998c).

their clusters. Mesoeconomic policies particularly need to target the institutional infrastructure necessary to support SME development and promote inter-firm co-operation and collective efficiency.

34. Education, particularly at secondary and higher levels, creates the tacit knowledge that is necessary to assimilate foreign and complex technology and acquire the necessary know-why in order to adapt and develop new technologies independently (Kim, 1997). High levels of absorptive capacity minimize the costs of foreign technology transfers and maximize technological learning because the assimilation of know-how is easier and faster. In many developing countries, low levels of technological accumulation point to a need for an overhaul of the educational system in order to incorporate basic technical and business education which will serve as a basis for either on-the-job training by firms or formal industry-wide education. It also points to a need to train science and technology professionals. According to Dodgson (1998), the lack of science and technology professionals translates into a weakness in many East Asian firms' abilities to manage innovation. Much of the technological strength of East Asian companies lies in production and project execution. As a result, too many East Asian firms are vulnerable to rising labour costs and the flight of their industries to lower wage cost locations.

35. In a number of cases the overhauling of the education system may have to include expanding English instruction, as is the case in Costa Rica where the campaign to transform the country through high technology has included an aggressive strategy to expand English instruction.[2]

36. Continuous upgrading requires continuous investments and improvements in the quality and quantity of education. A small educated elite is not sufficient for sustained competitiveness and can be a limiting factor in attracting complementary FDI. For instance, Costa Rica risks losing its competitive advantage before it even gets to enjoy it because it simply does not have enough skilled human resources of the type required by the 25 high technology foreign firms it has been able to attract since 1995. Competition for skilled labour among these companies is becoming intense, and there are concerns that it will result in wage inflation which could compromise profitability (Quinones, 1998).

37. Technological upgrading more often than not requires a corresponding upgrading in physical infrastructure. For example, the move to automated high-tech modes of production and the use of IT presupposes reliable supplies of electricity. Establishing and maintaining contact with customers and suppliers and receiving, processing and effecting the delivery of orders at minimum cost require an efficient telecommunications and transport system. The efficiency of its transportation and communications infrastructure made Singapore an attractive location for foreign firms. TNCs were able to expand operations and advance production to more complex products as a result of Singapore's

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[2] Costa Rica chose to upgrade and develop technological capability by targeting American FDI, hence the need for proficiency in English.

continuous improvements in educational quality and the capacity and efficiency of the transportation and telecommunications infrastructure (Hobday, 1994).

38. Many developing countries, and particularly LDCs, face a growing danger of marginalization because they lack the skills and infrastructure to reap the potential benefits from emerging information technologies (IT). Many manufactured products and commodities are not well suited for direct sale through the Internet (UNCTAD, 1998d). However, preliminary evidence shows that E-mail is the primary benefit of the Internet to developing countries, although its use is not as pervasive as in developed countries (Daly and Miller, 1998). Internet access remains scarce and expensive in developing countries, and unless current cost structures are improved, those countries' participation in electronic commerce will remain limited (UNCTAD, 1998e). The immediate and real potential for IT in developing countries lies in developing competence in using it across a whole range of economic activities in order to build organizational competencies that enable firms to operate more efficiently, keep up with competitors and provide distinctive value to customers (Lall and Wignaraja, 1998). Forward-looking Governments should gear up to provide both the physical infrastructure and the skills needed for information technology.

39. The ultimate goal of technological capability building is innovation. Innovation presupposes well developed local design and innovation capabilities that call for intense R&D activity by firms. A firm attains the highest level of technological capability when it acquires the ability to develop products based on knowledge acquired through its own R&D efforts. Without R&D, the firm's ability to adapt foreign technology and eventually develop its own new technologies will be severely constrained. In an innovation-based global economy, changes in the knowledge base are frequent and generate a need to tightly couple scientific knowledge and production (Aharoni and Hirsch, 1993). As a result, linkages between knowledge-creating institutions such as universities and research and technical institutions has become a critical factor in achieving and maintaining competitiveness.

40. R&D at the level of the firm is typically weak in developing countries. This may not be entirely unexpected given that R&D is considered not to be a priority for most developing countries because they are engaged in the catching up process which comprises mainly the mastery of mature and freely available technologies. However, experience shows that in a liberalized (and presumably competitive) environment and where the undertaking R&D is not a habit, free access to technology imports is unlikely to lead to pressures to invest in R&D - even when firms are upgrading their operational capabilities (Najmabadi and Lall, 1995). For instance, with the advent of trade liberalization, Tanzanian industries are reported to have has lost interest in local R&D, preferring to import proven technologies from abroad (Wangwe and Diyamett, 1998). This is an indication that it cannot be assumed that trade liberalization and export orientation will induce firms to invest in R&D. Another reason not to ignore R&D in developing countries is that imported technology often requires adaptation to local conditions, and the

adaptation and improvement of foreign technologies needs local R&D effort. Specific interventions are therefore necessary to promote a culture of R&D and maximize the complementarity between technology imports and local R&D efforts.

41. Many developing countries have established public sector institutions that specialize in science and technology activities. However, these institutions are typically underfunded and their research activities are not targeted at any specific group of enterprises and are generally not driven by the needs of the enterprises they purport to serve. The results of their research often cannot be easily commercialized and remain largely unknown to the enterprise sector. In spite of these problems, Governments still have a major role to play in subsidizing R&D activities. R&D is costly and time consuming, and SMEs simply do not have the specialized human or financial resources to carry it out. Thus, significant public participation in the provision of R&D is necessary in order to offset the inherent disadvantages of small size, which prevent SMEs from engaging in R&D.[3]

42. Most strategic technology partnerships or alliances do not involve developing countries. However, technology alliances involving developing country firms have been increasing in recent years. The RPI database[4] registered 30 technology alliances formed by TNCs in developing Asia, accounting for 10.5 per cent of the total R&D activities of TNCs in developing Asia (Reddy, 1999). Notwithstanding this, it would appear that the forms of partnering in developing countries that will involve SMEs in any significant numbers are those involving linkages between firms and parts of the technological infrastructure, especially universities, research institutes and technology agencies (James, 1994). Upgrading SME clusters in developing countries will necessarily entail a reorientation of public R&D institutions to link their activities to their intended users and ensure a demand-driven focus to their work.

43. An important element of technology infrastructure is quality assurance institutions and the support available to firms for quality management. Meeting ISO 9000 quality management standards is increasingly becoming a prerequisite for international trade and integration into the global economy. The spread of ISO 9000 accredited quality management systems has not yet reached significant levels in LDCs and most developing countries. Few SMEs in developing countries engage in systematic quality control or have routine equipment maintenance capabilities. Fewer still are able to meet the costs of obtaining ISO certification and maintaining it, and this is a major deterrent for most SMEs from aiming

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[3] Kim (1997) suggests that the size disadvantages of SMEs in R&D, coupled with the advantages that larger firms have in investing in their own R&D, mitigate in favour of achieving a balance between the number of small firms and larger firms in an economy, or introducing a large firm which could assume the role of the leader to an SME cluster. He suggests that the economy of the Republic of Korea could benefit from an injection of flexibility that comes from having more SMEs. On the other hand, Taiwan, Province of China could profit from having more large enterprises capable of financing and engaging in their own R&D.

[4] This database on strategic R&D activities of TNCs outside the industrialized world has been developed by Prasada Reddy at the Research Policy Institute, Lund University, Sweden.

to obtain certification. Government assistance will be necessary to assist SMEs meet the expense involved in getting ISO 9000 certification. Technologically dynamic buyer-seller relationships involving clusters and their foreign buyers can be instrumental in improving quality control and obtaining ISO certification. Co-operation between the public and private sector was instrumental in bringing the Pakistani surgical instrument cluster up to international standards and developing the necessary specialized support services and institutions for its SMEs (UNCTAD, 1998b).

IV. UPGRADING SME CLUSTERS

44. The evidence indicates that various interventions can help upgrade and enhance the competitiveness of SME clusters. The following is a review of selected case studies of effective interventions aimed at technological upgrading and capability development. The case studies cover a range of measures that includes skills enhancement through training and the provision of technological and R&D support to SMEs.

A. Skills enhancement

45. A significant part of skills enhancement comes from training in the course of employment. In a world of rapidly changing technologies and new organizational methods, it is essential for industrial firms themselves to invest in training their employees. A World Bank study of enterprise training found that firm-level training has a significant and positive effect on the productivity of all types of firms.[5]

46. Singapore is a regional leader in employee training programmes held outside the firm. Experience shows that high technology industries obtain larger productivity gains from training than low technology industries. Accordingly, Singapore's strategy to upgrade was based on creating and enhancing specific high technology skills at post-employment level (see box 2).

47. Experience also shows that training skilled workers yields more productivity improvement than training unskilled workers. Singapore's focus on apprenticeship training for pre-workers offsets the disadvantages of training unskilled labour while ensuring the availability of a pool of appropriately skilled labour to facilitate the expansion of existing industries and the establishment of new ones. TNCs often cited the availability of low-cost engineers, technicians and skilled workers as a primary reason for locating in Singapore (Hobday, 1994).

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[5] Quoted in Lall and Wignaraja (1998), the study examined the effects and determinants of training in several developing countries in Asia and Latin America.

48. By 1990 more than 3,000 TNCs (including 600 large firms) from Europe, Japan and the United States had established operations in Singapore (Hobday,1994). As firms developed, the Government made improvements to infrastructure and the supply of engineers and technicians. Institutes for software training, electronics engineering, advanced mechanical engineering and research were set up as part of the Government's policy to encourage TNCs to extend their value-added activities such as design and R&D and make Singapore their headquarters for R&D. The advisory boards of the institutes include managers of TNCs who advise on specific projects and overall direction in line with the Economic Development Board's policy of public-private sector co-operation.[6]

Box 2

Singapore's training system

In order to promote the manufacturing sector, the Government of Singapore established policies for education, training and skills development. Unusually, the Government collaborated with TNCs to jointly set up these centres and develop apprenticeship schemes under which employees receive salaries while they are undergoing training in state-of-the-art, complex manufacturing technologies. The Economic Development Board (EDB) also worked jointly with foreign Governments to provide technical training.

For example, the Vocational and Industrial Training Board (VITB) offers a range of courses, including broad-based pre-employment full-time skills training for school leavers and part-time skills courses for workers. It also offers customized courses based on requests from companies.

VITB offers apprenticeship training to school leavers and ex national servicemen consisting of on-the-job training under the supervision of experienced and qualified personnel from participating industries as well as theoretical lessons conducted at VITB training institutes or industry/company training centres. VITB also provides, in collaboration with industry, testing and certification of its trainees and apprentices, as well as trade tests for public candidates.

By 1991, the National University of Singapore, Nanyang Technological University, polytechnics and the institutes together trained around 22, 000 engineers and craftsmen per annum.

Extracted from various sources.

49. SMEs in developing countries generally neglect training, apart from informal on-the-job instruction that consists of watching and imitating experienced workers. SMEs usually eschew investing

[6] For a discussion on the respective roles of the public and private sector and their interaction for SME development see UNCTAD (1997).

in their employees because of the difficulties they perceive in appropriating the benefits of such training. More importantly, they lack the financial resources to do so.

50. Capability development is a costly process. Tax incentives for training mainly benefit large firms. SMEs also face greater market failures in terms of information, access to credit and access to technology support services as compared to larger firms. Successful economies, both developing and developed, have put in place schemes to meet the special needs of their SMEs in respect of information, skills, finance, management training, market information and technology support.

51. In order to achieve upgrading of SME clusters, it will be critical to convince SMEs of the importance of training and provide training and credit packages in addition to other technical and marketing support.

B. Financing skills development

52. Box 3 describes some of the measures which different countries have put in place in order to help SMEs meet the costs of training their workers. In a world of rapidly changing technologies and new organizational methods, it is essential for firms themselves to invest continuously in training their workers.

53. In countries like Japan, training exceeds the Governments's entire education budget. In the United States, firms spend around 7 per cent of sales on training (Lall and Wignaraja, 1998).

54. In many developing countries,it may be necessary first to establish the relevant training institutions. It is important to note that private training institutes are more responsive and effective than public institutions. Wherever possible, such training should be provided in cooperation with the private sector. For example, it is normal in the Republic of Korea and Singapore for industrialists to participate in the development of the curriculum for technical training.

Box 3

Financing training

Another instrument of training policy in **Singapore** is the Skills Development Fund (SDF), set up to provide training grants to SMEs of between 30 and 90per cent of total costs. During the early 1980s, the SDF was financed by a levy on employers of around 4 per cent of workers' wages, matched by government contributions. Since 1992, the SDF has been funded by a levy of around 1 per cent on wages of less than S$170 per month.

The Training Voucher Scheme supports employers in respect of training fees. In 1990 this scheme benefited 3, 000 new companies, many of which had 50 or fewer employees. The Training Leave Scheme encourages companies to send their

employees for training during working hours. It provides 100 per cent funding for training in approved programmes. In 1990, over 5, 000 workers benefited from this particular scheme.

The success of the SDF is due in part to its strategy of incremental implementation. Initially, efforts focused on creating awareness among employers, with ad hoc reimbursement of courses. The policy was then refined to target in-plant training, and reimbursement increased to 90 per cent of costs. Further modifications were subsequently made to encourage the development of corporate training programmes by paying grants up-front, thus reducing interest costs to firms.

Since the 1970s, the Republic of **Korea** has imposed a 5 per cent payroll levy for training on medium and large firms. In **Malaysia**, the payroll levy for training is 1 per cent.

Since 1989, **Mauritius** has also put a training promotion scheme in place. The Scheme is administered by the Industrial and Vocational Training Board (IVTB). A 1 per cent levy on basic salaries is used to provide incentive grants to firms for training on a cost-sharing basis. The size of the grant is related to the costs of training and not the amount contributed to the levy fund. The IVTB scheme applies to approved in-house training programmes as well as training in institutions registered with IVTB, and includes overseas courses.

Extracted from Lall and Wignaraja (1998) and Hobday (1994).

C. Promoting capability development by SMEs

55. Box 4 describes some of the ways in which Taiwan, Province of China helps its large number of SMEs. The Taiwan case is perhaps the most interesting because of the central role played by SMEs in the industrial and export growth of that economy. Taiwan, Province of China is considered to have the most effective technology extension and contract research service in the developing world, which has allowed it to exploit the inherent flexibility of SMEs to meet changing demand conditions and develop market niches. Taiwan, Province of China has been able to achieve rates of export growth nearly as high as those of the Republic of Korea.

Box 4

Support for SMEs in Taiwan, Province of China

Taiwan, Province of China has around 700, 000 SMEs that account for 70 per cent of employment, 55 per cent of GNP and 62 per cent of manufactured exports. An impressive set of programmes has been put in place to support them.

Government-supported technological and scientific research institutes have been indispensable in the territory's high technology industrial development. The government has spent extensively on R&D and has a succession of programmes designed to encourage indigenous technological capabilities in strategic technologies.

Management and technology assistance is provided by the China Productivity Centre (CPC), the Industrial Technology Research Institute (ITRI) and a number of industrial technology institutes covering the metal, textile,

biotechnology, food and information industries. These institutes provide a range of services including training, quality systems, technology development, and the acquisition of foreign technology.

The CPC is well known for its efforts to promote automation to cope with rising wages and needs in respect of precision and quality. The CPC sends teams of engineers throughout the country to demonstrate to enterprises the best means of automation and solve relevant technical problems by carrying out research projects or linking enterprises to research centres to solve more complex technical problems. The government encourages private industry to contract research to universities. Such contracts are funded through research grants with enterprises providing matching funds.

ITRI was established to undertake R&D considered too risky for the private sector and has played a major role in developing local technological capabilities in firms. Through the Open Laboratory Programme, ITRI provides space and facilities for joint R&D between ITRI researchers and local business. It also has space for business incubation and training facilities. The government subsidises 60 per cent of the cost of total consultancy services for firms.

Other measures related to promoting SME networks and clusters and their upgrading include the Centre Satellite Factory Programme of the Ministry of Economic Affairs. The programme integrates smaller factories around a principal one involving vendor assistance and productivity raising efforts as well as a rational sharing of tasks between participating enterprises. By 1989, 60 networks with 1, 186 satellite factories were in operation, mainly in electronics. In 1980, the government also set up a science park in Hsinchu with 13, 000 researchers in two universities, six national laboratories (including ITRI) and technology institutes. The Park offers a wide range of tax incentives, low interest loans, R&D and manpower training grants, and duty-free importing of equipment and materials. In 1995 it had 170 companies specializing in electronics. Initially the government invested directly in small start-ups, but increasingly private venture capital companies are assuming this role. The Park has proved successful in attracting returned expatriates. Park companies are successful technologically and have entered into international strategic alliances.

Extracted from. Lall and Wignaraja (1998). and Dodgson (1998).

56. Fostering firms of a size able to launch independent R&D and clustering smaller firms around them in order to create synergies and co-operation as Taiwan, Province of China is attempting to do through its Centre Satellite Factory Programme is one option. Providing incentives for TNCs to increase R&D activity is another option.

V. IMPLICATIONS FOR POLICY

57. The main challenge to policy-makers in developing countries is to help SME clusters to follow the 'high road' by creating an environment that stimulates and supports learning, innovation and constant upgrading.

58. Technological upgrading and capability development cannot be achieved without the development of crucial institutions, laws and organizational structures. In addition, it will be difficult to initiate low-cost technological upgrading in economies where physical infrastructure and

telecommunications are inadequate and inefficient. Accordingly, policy must ensure the availability of both physical and human capital, as well as vital technological infrastructure. Knowledge-creating institutions such as universities, research institutions and technical agencies play a vital role in stimulating and facilitating technological capability development and innovation. Policies must promote beneficial interlinkages between such institutions and SMEs. Building and strengthening interlinkages between these knowledge-creating institutions and their counterparts in the North would also facilitate knowledge creation in the South and enhance the positive impacts of globalization.

59. In some developing countries, what may be initially required to promote competitiveness and efficiency are improved skills and an efficient technology infrastructure (for standards, metrology, quality assurance, etc.) before elaborate R&D facilities are created (Najmabadi and Lall, 1995).

60. Policies such as those to improve the level, quality and quantity of education and educational output and R&D have too long a gestation period to have a quick impact. In the short term, efforts will have to focus on increasing the production and process capabilities of existing enterprises. For example, mechanisms will be necessary to compensate for absent domestic skills. Hiring expatriate managers where local staff do not possess the necessary technological information is one way in which firms can substitute for skills not available on the local market. However, the policy environment must be conducive to such mechanisms being employed by local firms while at the same time ensuring that skill gaps in the domestic market are being eliminated.

61. Demand-side interventions such as outward orientation and trade liberalization have proved not to be sufficient conditions to stimulate investment by firms in technological capability development. Specific supply-side interventions aimed at strengthening the technological infrastructure to enable firms to develop capabilities will also be required. Policies for both the demand and supply of local technological effort are mutually reinforcing, and it is unlikely that one will work without the other. A phased approach to liberalization is preferable to shock treatment. The pace and exposure to international competition should be based on a realistic assessment of the learning or relearning needs of activities which are potentially viable. Liberalization should not be so sudden as to abort technological effort by domestic firms.

62. Since innovation policies are most effective when directed at networks or clusters of firms, policies to promote successful inter-firm cooperation will also contribute to the development of local technological capabilities.

63. Clusters and dynamic local economies are the development counterparts of the globalization process. Experience shows that strictly top-down interventions aimed at solving problems at the micro level can easily fail. This means that while macro policies are needed (such as promoting open markets, streamlining import and export regimes and protecting property rights), measures to stimulate upgrading

and the development of technological capabilities will need to be formulated and also implemented at the local and regional level. They will need to involve the private sector as both a development partner and the intended target of the interventions. Since cluster upgrading is highly context-specific, a progressive shift towards decentralized, flexible, bottom-up, tailor-made policies has to occur. Interventions at the meso level thus represent the most appropriate level at which to launch and monitor the process of upgrading and technological capability development. The importance of meso-level institutions such as universities and research bodies, business development service providers, business associations, etc., cannot be overstated.

64. The process of technological upgrading and capability development is dependent on contextual factors. SME clusters in developing countries and in LDCs are at a particular disadvantage because the environment within which they operate is not always conducive to enterprise development. Vital business services and other forms of institutional support are often absent or inadequate. Changes in international rules of trade are also exposing developing country SMEs to stringent competitive conditions that require them to expend much more effort in order to remain viable. The process of upgrading will be that much harder, slower and more costly for SMEs in developing countries because of it.

65. FDI can be a powerful instrument for technological upgrading. Careful targeting of FDI to clusters and industries that are potentially competitive can complement and enhance local capabilities. FDI has not, however, proved as effective in the development of technological capability and cannot substitute for local technological effort. There is therefore no real choice between technological capability development via FDI and capability development by other methods. For example, until recently, Singapore's innovation policy was one-dimensional, focused on attracting TNCs and then providing incentives for them to undertake R&D and design products locally. Policy has now altered to focus on the active encouragement of local technological capabilities. EDB has established the Local Industry Upgrading Programme to facilitate technology transfer (see box 2).

66. The technological benefits from FDI can only be accessed and maximized by firms that have the absorptive capacity to do so. Policy interventions are needed to enhance the absorptive capacity of local firms and to assist local firms not only to absorb the technology which the foreign investor chooses to bring but also to negotiate for technology that they want. Subcontracting is facilitated and encouraged by low transaction costs and the efficiency of potential suppliers. At current levels of education and skill, the transaction costs of extensive subcontracting of the kind which yields superior levels of technology transfer are likely to be very high in developing countries. Specific interventions aimed at making local firms 'ready' for subcontracting and partnerships will have to be put in place.[7] Institutions such as

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[7] See UNCTAD (1998c).

universities, research institutes and technical support agencies can play a vital intermediary role in strengthening the bargaining power of local firms in securing transfer of foreign technologies.

67. The dissemination of technological information is as important as R&D and the development of new technology. Apart from engaging in frontier research and development, universities and other research institutions can play a vital intermediary role in the dissemination and diffusion of information on existing technologies, thus increasing firms' know-what and know-who capabilities. Know-what and know-who capabilities contribute to the acquisition of know-how capabilities. For example, the ability of a firm to substitute for absent domestic skills implies that it possesses certain capabilities related to identifying the relevant sources of required skills quickly and cheaply, as well as knowledge on how to incorporate these skills productively. Business or industry associations can also play an important role in this regard.

68. Financial interventions, such as direct subsidies for R&D and the training of workers, are a critical element of interventions aimed at upgrading or enhancing the technological capabilities of SMEs. Access to finance is a major constraint for all SMEs. Most SMEs have difficulty just purchasing available technology which can significantly improve their productivity. In many developing countries a major part of the upgrading process will include providing SMEs with the necessary access to credit in order to purchase modern equipment.[8]

69. Ensuring a balance between the potentially negative impacts of liberalization on a technologically weak economy, juggling commitments entered into at the global level with the need to develop domestic technological capabilities as fast as possible and at least cost and designing and implementing upgrading and capability development policies and programmes implies learning and competence accumulation on the part of Governments themselves. This means that Governments should focus on acquiring the necessary skills at the local and national levels in order to fulfil this complex task and in order to successfully negotiate improved access to technology at the global level for their domestic firms. It also emphasizes not only the need for policy coherence between and among the various levels of government, but also the need for coherence between policies at the national and international levels.

[8] For issues concerning financial services for SME development and lessons from microfinance see UNCTAD (1999b).

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CAN ELECTRONIC COMMERCE BE AN ENGINE FOR GLOBAL GROWTH? ELECTRONIC COMMERCE AND THE INTEGRATION OF DEVELOPING COUNTRIES AND COUNTRIES WITH ECONOMIES IN TRANSITION IN INTERNATIONAL TRADE

Note by the UNCTAD secretariat

Executive summary

This paper, based on many of the analytical elements which will be developed in the background documentation for UNCTAD's regional workshops on electronic commerce to be held between July and October 1999, and in the context of the substantive preparations for UNCTAD X, stresses that access to electronic commerce remains uneven. This situation is all the more regrettable since electronic commerce has the potential to be a major engine for trade and development on a global scale in the next few years. On the basis of the work carried out so far under the auspices of the Commission on Enterprise, Business Facilitation and Development, two main areas of priority are proposed for future work: (1) the production of data, analyses and scenarios relevant to electronic commerce and development, and (2) the examination of ongoing and emerging trends in the global information economy and their possible impact on developing countries' participation in electronic commerce.

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Introduction

1. Further to the agreed conclusions of the Commission on Enterprise, Business Facilitation and Development at its third session, held from 23 to 27 November and on 14 December 1998 (see TD/B/COM.3/20), the secretariat has given priority to the following activities in its work on electronic commerce:

(a) In cooperation with other international and regional organizations working in the field of electronic commerce, the secretariat is gathering information on the development-related dimensions of electronic commerce, in order to make such information available through the worldwide web. Such efforts are being pursued in particular in the context of an informal group of Geneva-based institutions involved in electronic commerce, for which a common website is currently under construction. It is expected that, as a result of this joint effort, UNCTAD's own website will also be enriched regarding electronic commerce.

(b) UNCTAD has pursued its analytical and research work on the links between electronic commerce and development, with special focus on measures and policies likely to enhance the ability of these countries to participate more fully in global electronic commerce. A significant part of this work is being developed in the context of the preparation of regional workshops on electronic commerce, which the Commission also requested the UNCTAD secretariat to organize.[1] Other relevant organizations[2] have been approached in order to produce joint studies in areas of particular interest to developing countries and economies in transition, with particular importance being attached to the links between electronic commerce and trade facilitation. As they become available, such studies will be fed into the process of substantive preparations for UNCTAD X.

2. In addition to the series of background papers produced by the UNCTAD secretariat for the various sessions of the Commission, as well as for the expert meetings convened by the Commission since 1996,[3] a number of studies and contributions are currently being produced either as part of the work requested by the Commission (e.g. regional workshops) or as part of

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[1] This series of workshops and round tables will begin with a pre-UNCTAD X workshop on the exchange of experiences among enterprises involved in electronic commerce, to be held in Geneva from 17 to 18 June 1999, and should be followed by three regional meetings in Latin America in July 1999, Africa in September 1999 and Asia in October 1999. A background paper on electronic commerce and development will be produced by the UNCTAD secretariat as a basis for discussions in these regional meetings.

[2] Including the World Bank, the International Monetary Fund (IMF), the Organisation for Economic Co-operation and Development (OECD) and the International Telecommunication Union (ITU).

[3] See, in particular, the following documents related to electronic commerce: "Telecommunications, business facilitation and trade efficiency: some major implications of the global information infrastructure (GII) for trade and development" (TD/B/COM.3/EM.3/2), "Policy issues relating to access to participation in electronic commerce" (TD/B/COM.3/16), "Implications for trade and development of recent proposals to set up a global framework for electronic commerce" (TD/B/COM.3/17), "Training in the area of electronic commerce: needs and possibilities" (TD/B/COM.3/EM.6/2) and "Electronic commerce: legal considerations" (UNCTAD/SDTE/BFB/1). UNCTAD documentation can be found at our website: http://www.unctad.org

the various preparatory processes leading to UNCTAD X. It is expected that such work will progressively converge towards a set of policy proposals and recommendations designed to enhance the participation of developing countries and economies in transition in global electronic commerce.[4]

3. It is too early to predict how the expansion and growth of electronic commerce could affect the integration of developing countries and economies in transition on the global economy. However, it is possible to (i) take stock of recent trends relevant to this issue, (ii) identify some key issues requiring immediate international attention, and (iii) outline possible priority areas for future work on the relationship between electronic commerce, globalization and development.

I. THE MAIN TRENDS AFFECTING ELECTRONIC COMMERCE AND THE DEBATE ON ELECTRONIC COMMERCE AND DEVELOPMENT

A. Uneven access

4. The basic data provided in the report "Policy issues relating to access to participation in electronic commerce" (TD/B/COM.3/16) about disparities in access to basic telecommunications infrastructure and Internet hosts remain valid. On one hand, it is true that over the last five years the Internet has evolved from a network of some three million (predominantly United States-based) users into a commercial mass medium of over 100 million users worldwide, and that data traffic over the Internet is estimated to double every 100 days. On the other hand, it remains worth stressing that most rural areas in developing countries are still largely unconnected, and that even in countries listed as "electronic-commerce enabled", the cost of access to the Internet remains far beyond the means of most small and medium-sized enterprises.[5]

B. The accelerating and pervasive growth of electronic commerce

5. It is well known that estimates of electronic commerce, and associated projections of its growth, are subject to wide differences depending on the source and methodology employed. The statistical situation is improving, however, and it is at least possible to give a credible range within

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[4] Because such a set of proposals and recommendations would be the development counterpart to the four initial proposals made by developed countries on a global framework for electronic commerce (made, respectively, by the European Union, Japan, the United States and the OECD), it has often been described as the "fifth element" of proposals on global electronic commerce. Given the possibility that electronic commerce issues could be addressed at the Third Ministerial Meeting of the World Trade Organization (WTO) in Seattle in November–December 1999, it is to be expected that the work of relevant institutions (including UNCTAD) on these issues will intensify in the coming months.

[5] For example, in 1998, the average annual cost of a 20h/month Internet connection (off-peak use, excluding line rental charges) varied from US$ 9 in Malaysia to US$ 79 in Luxembourg. However, if the costs are viewed in relation to national income per capita, one obtains a more striking figure: in countries like France or Germany, the price of such a connection was roughly the equivalent of one week's income, whereas it was close to 12 weeks' income in Venezuela, and 16 weeks' in the Philippines.

which the value and geographical distribution of business is likely to fall. Most sources begin with numbers for electronic commerce dating from around 1995.

6. To fix a base, the OECD, in its preparatory work for the October 1998 Ottawa conference on electronic commerce, examined a dozen different sources and worked out the median of those estimates for the period 1995–1997. The figures suggested that the global value of all electronic commerce (national and international) was around US$ 725 million. In the same exercise, the OECD scrutinized the projections which these forecasting groups had made for the period 2000–2002. The median estimate was in excess of US$ 154 billion. In other words, the expected expansion using the median estimates was about 250-fold.

7. In March 1999, ITU reviewed the estimates of electronic commerce revenues. The figures reveal projections for business-to-business transactions in the period 2001/2002 ranging between US$ 100 billion and US$ 400 billion. Corresponding revenues from business-to-consumer transactions are much smaller, with again a large spread of projections from US$ 25 billion to US$ 90 billion in 2001/2002. These figures relate to the expected values of actual transactions, that is, Internet-based sales, and produce a low-end projection of some US$ 125 billion in the next two years and a high-end projection of about US$ 500 billion. Since at present a major function of electronic commerce as actually used by many economic agents is to facilitate the search for information, a broader estimate of the impact of electronic commerce would include the estimated value of transactions which are initiated online, though concluded in more traditional ways. Here the high-end projections for 2001/2002 suggest that the figure might be of the order of US$ 1.23 trillion, meaning that roughly 40 per cent would be transactions fully completed online, and about 60 per cent would correspond to deals facilitated by the Internet but not concluded on it.

8. Data on website revenues in 1998 show the massive dominance of the United States market: 93 per cent of all business related to websites based there, while roughly 62 per cent of websites were located in the United States.[6] Revenue per website in the United States is currently about 50 per cent higher than the global average. Other regions of the world thus have only a minimal participation in revenues from electronic commerce. In fact, according to 1998 estimates, non-OECD countries accounted for scarcely more than 2 per cent of global revenues from electronic commerce.

C. The potential of electronic commerce as a major engine for international growth and trade

9. The sectoral focus of electronic commerce, or rather the focus of its activities, is fast becoming broader, but some strong patterns remain apparent:

(a) ***Finance*** has long been a major user of electronic data interchange (EDI), with intranets and extranets ensuring electronic communications among dealers. The advent of

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[6] This phenomenon is being accentuated by the fact that top-level domain names (including .com addresses) are considered as "United States names" even when they belong to companies or individuals in other countries.

electronic commerce, however, has also spurred households to make use of electronic banking and online trading of financial securities.

(b) ***Travel and tourism*** is an area where online business is rapidly replacing face-to-face dealings. Two main factors seem to account for this. Information searches are a major part of the "consumption effort" in these fields, and Internet availability greatly cuts the time and costs of a search. The pricing of travel, in particular, also lends itself to online auctions which promise buyers substantial savings compared with the single dealing which has traditionally held sway. In the United States the Internet approach has already dramatically altered the composition of the market in this field.

(c) Virtually all facets of the ***marketing of entertainment*** are being transformed by the Internet. Indeed, this is one branch where the actual digitization of products is making them available, in hitherto unexplored combinations, direct to the consumer. These changes usually involve a sharp reduction in cost, but they have also led to serious disputes regarding piracy of intellectual property.[7]

(d) ***Other service sectors*** being dramatically affected by the expansion of Internet-based electronic commerce include insurance, brokerage and advertising. Moreover, the distribution of an increasing number of manufactured goods (such as books, computers or cars) is being radically transformed by electronic commerce.

10. In all these sectors, it is important to note that part of the expansion of electronic commerce comes from its takeover of activities which previously were accomplished through extranets. This applies particularly to business-to-business relations between major firms and their suppliers. Now, as part of the drive to cut costs in large industries and ensure that input and service suppliers are the best available, an Internet approach is being employed to link all partners. Standards are set by the purchasers, and suppliers must meet them. The automotive business is a leader in this field, though textiles and clothing, retail operations and other activities where subcontracting forms a critical part of operations are also targets. All these transformations are likely to translate into massive shifts in international comparative advantages, as specific products (particularly services) are increasingly traded by means of new "modes of delivery", to use WTO terminology.

11. However, much more important than the visible and foreseeable impact of electronic commerce on trade in specific services will be the transformations that electronic commerce will generate by promoting new industrial organization models (corporate structures) and business models (mechanisms to generate profit and competitiveness). Indirectly, such transformations will also underpin significant changes in the legal and regulatory environments required by global electronic commerce, and they will eventually affect jobs, qualifications and employment in general, as well as the power relations between producers, consumers and business partners. As the resulting "new deal" will put more emphasis on comparative advantages built on information, knowledge, education and culture, it may help developing countries and economies in transition to become better integrated in the emerging global economy. To do this, however, action would be required in a number of strategic areas.

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[7] See for instance, the current debate on the "MP3-based" transport of musical products.

II. ELECTRONIC COMMERCE AND DEVELOPMENT: WORK ACCOMPLISHED BY THE COMMISSION AND POSSIBLE AREAS FOR FUTURE WORK

12. So far, the work of the Commission in addressing electronic commerce issues has focused on three major areas, namely: (i) capacity-building (especially through the work of its expert meetings, which have dealt with access to telecommunications, human resources development and the legal aspects of electronic commerce); (ii) the identification of obstacles to developing countries' participation in electronic commerce; and (iii) the exchange of information and experiences in the area of electronic commerce.

13. While such work certainly needs to be pursued and stepped up,[8] a greater participation in electronic commerce by developing countries and economies in transition will require additional work in a number of areas, including the following:

(a) ***Scenarios and statistical underpinning:*** developing countries and economies in transition need to assess the potential impact of electronic commerce on their current and future trade structure. How will their present comparative advantages (e.g. in service sectors such as tourism or transport) be eroded or strengthened? In which activities could they contemplate building new strategic advantages? To what extent would factors such as international trade negotiations, the domestic regulatory environment and global corporate strategies affect such scenarios? Fiscal scenarios will be of particular importance in this context: for instance, what would be the impact on these countries of a "duty-free" Internet-based trading environment? Would the effects of trade creation and trade substitution offset losses of government revenues, and, if so, at what pace and with what kind of domestic effects? Could statistical knowledge about the actual use and accessibility of information technologies be enhanced in order to better describe the specificities of less developed economies? How do the various components of civil society in these countries perceive and value electronic commerce-related technologies and know-how?

(b) ***Structural changes in the world economy and their impact on electronic commerce:*** the emergence of information as a central factor of production and competitiveness has triggered a number of significant changes in the ways value is created and distributed. At the same time, global strategies have been designed and developed around information-intensive activities, and new power relations have emerged in the process. For example, it would be important to assess how the recent wave of mergers and acquisitions (and possible dominant positions) in the field of telecommunications and web-related activities and equipment (including routers) are affecting prices, access and quality of service in the area of the Internet, particularly in the area of electronic commerce. It would also be interesting to explore how well the enterprises of developing countries and economies in transition would fare in an environment

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[8] This is particularly true in the context of preparations for the WTO Ministerial Meeting of November–December 1999 and the preparations for UNCTAD X.

dominated by the new business models emerging from the Internet.[9] Other developments regarding the Internet, such as the new structure being established for domain names and the emergence of new types of intermediaries (often called "infomediaries"), portals and certification bodies and procedures, also have a significant impact on the power structures which will help to shape the future of electronic commerce. These developments certainly deserve to be explored further from a development point of view.

III. SCOPE FOR ACTION

14. In a fast-changing area such as electronic commerce, there is always a strong temptation to sacrifice longer-term objectives to the fascination of short-term issues. Much has been said, for instance, about business-to-consumer electronic commerce (an area of electronic commerce that has really taken off in the late 1990s), but far less has been said about business-to-business electronic commerce (which will soon constitute a respectable share of international trade, and in which developing countries might find an engine for their integration in the global economy). A similar short-sightedness can be seen, to some extent, in the ongoing discussions on possible trade negotiations on electronic commerce: for all countries – but significantly more so for developing countries – the effects of electronic commerce will be far greater and more profound than expected, and will not be confined to the trade area.

15. At the same time analyses, policies and actions in the area of electronic commerce will need to reflect its truly multifaceted nature. Its technical, economical, legal and social aspects will need to be considered jointly and comprehensively if such analyses, policies and actions are to be relevant and effective. From a practical point of view, this will require both inter-institutional cooperation at the international level and cross-sectoral cooperation at the national level (including through the constitution of national task forces on electronic commerce). Both these aspects would need to be reflected in UNCTAD's work on electronic commerce: the high degree of inter-institutional cooperation that has characterized its work since its inception should be strengthened,[10] and extended to non-governmental entities, including organizations from the private sector.[11]

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[9] One should rather speak of "business models" (the Amazon.com case being significantly different from that of Dell computers or Yahoo.com for instance). However, such models have in common a certain number of characteristics (including a strong emphasis on lower transaction costs, market share, customer visibility, branding and "just-in-time" production methods) which may be more common in advanced countries than in the developing world.

[10] Recently, draft memoranda of understanding have been exchanged between UNCTAD and ITU and between UNCTAD and WIPO. As efforts to increase cooperation with these organizations are pursued, electronic commerce is likely to feature prominently in both cases.

[11] For example, the Partners for Development meeting held in Lyon from 9 to 12 November 1998 (particularly in its GET UP (Global Electronic Trade United Nations Partnership) segment) made it possible to enhance cooperation between UNCTAD and organizations such as the International Chamber of Commerce (ICC) and the Global Information Infrastructure Commission (GIIC).

16. While putting priority on such cooperation, UNCTAD should seek to develop its comparative advantages in the area of electronic commerce. Its focus on development is one specificity that UNCTAD would bring to electronic commerce issues. Another is its unique ability to address both the physical and logistical aspects of electronic commerce, that is, to embrace not only its information flow aspects (e.g. those related to marketing, advertising, credit information or payments in electronic format) but also its logistical and physical components (including transport, customs and trade facilitation instruments).

17. More generally, the following areas deserve attention:

(a) ***Access:*** in spite of its rapid expansion, the Internet is still often too expensive for smaller users in developing countries, especially in the least developed countries and rural areas. The provision of recent global statistics and data in this field (including data on the economic conditions of access) could be one result of possible closer cooperation between UNCTAD and ITU.

(b) ***Human resources:*** in information-intensive activities, capacity-building often revolves around human resources development. The sensitization of Governments and business to the importance of electronic commerce, and the dissemination of the relevant technical and managerial skills remain priorities. Training modules (including modules for training trainers locally) could be developed to enhance developing countries' ability to take advantage of the expansion of electronic commerce.

(c) ***Content:*** the ability to access networks and the capacity to use them to acquire and disseminate information are necessary but not sufficient conditions for worldwide participation in electronic commerce. The ability (especially of small and medium-sized enterprises) to benefit from electronic commerce will imply the increasing production of "local content for global networks", including through language and cultural diversity. The ability of developing countries to participate in electronic commerce not just as consumers but also as producers could be promoted by disseminating the appropriate tools and know-how and by stimulating exchanges of experiences regionally and interregionally.

(d) ***Legal and regulatory frameworks:*** electronic commerce transactions will not flourish in the absence of trust mechanisms. Issues such as certification, authentication, protection of intellectual property and encryption will need to be considered from a truly global point of view, that is, by involving developing countries in the relevant discussions and negotiations. The creation of a reliable legal framework needs to be considered both at the national level and at the international level.

(e) ***Financial and fiscal dimensions:*** payment guarantee mechanisms, as well as trade-financing techniques will be radically affected by the expansion of electronic commerce. Electronic payments will also need to be considered from the point of view of their possible impact on monetary creation. The impact on developing countries of various electronic commerce fiscal scenarios (e.g. duty-free Internet-based commerce) is still unclear and needs to be further explored.

(f) ***Security, power and governance issues:*** the respective roles of Governments, international organizations and the private sector in defining some of the underpinnings of electronic commerce (Internet top-level domain names, trademarks, content control, etc.) need to be further defined. As traditional transaction chains are being "de-intermediated", many intermediaries are becoming less relevant, but new categories of intermediaries (infomediaries) are emerging, and there is a tendency to concentrate in their hands a disproportionate amount of the power to shape the networks and their usage. This is particularly true in the case of portals.

18. Many of the themes outlined above will be developed in greater detail in the background paper which will be produced for the series of regional workshops which UNCTAD will be organizing, as requested by the Commission at its third session.